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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,576	12/28/2000	Heu-Gon Kim	5000-1-181	6522

33942 7590 07/08/2003

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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/750,576

Applicant(s)

KIM ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

### *Remark*

- This Office Action is in response to applicant's amendment filed on May 6, 2003, which has been entered as paper number 13.
- By this amendment, the applicant has amended claims 1, 4, and 7 and has canceled claims 5 and 6.
- Claims 1-4 and 7 remain pending in this application.
- The rejection to claims under 35 USC 112, first paragraph, concerning NEW MATTERS, as set forth in the previous Office Action is **withdrawn** in response to applicant's amendment.
- The rejection to claims under 35 USC 112, first paragraph, concerning the period of the stripes as set forth in the previous Office Action **still holds**.
- The rejections to claims under 35 USC 112, second paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.

### *Claim Objections*

1. Claims 1-4 and 7 are objected to because of the following informalities:

(1). **Claim 1 has been amended** to include the phrases "a light source" and "lines defined by rays of ultraviolet light" that are not clearly related to each other. It is not clear if the light source is a ultraviolet light source or not. The phrase "the ultraviolet light source" recited in claim 2 is confusing and indefinite since it lacks proper antecedent basis from its based claim as the result of the amendment.

(2). The **amended** claim 1 recites the phrase "a positioning of a lens system between ... and of the amplitude mask between..." that is confusing and unclear. It is not clear what is considered here as "a positioning of". It is not clear if the phrase is referred to "selecting a positioning"? Furthermore it is not clear if the positioning of the amplitude mask is also "selected". **If so the specification fails to provide**

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support for such selection. The feature concerning “selecting a positioning of amplitude mask” will be rejected as new matters added to the claims if such is intended.

(3). The phrase “any wavelength of the said light” recited in claim 7 is confusing and indefinite since it is not clear what is this “any wavelength” referred to. The claims have a general light source and have a ultraviolet light. It is not clear the “any wavelength” is referred to what.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. ***Claims 1-4 and 7 are rejected under 35 U.S.C. 112, first paragraph***, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

***Claim 1 has been amended*** to include the feature having the width of each stripe becomes narrower however in earlier part of the claim states that only a *single* grating period of the stripe is set to make the *ratio* of the period of the mask to the period of the grating stripes equal to the ratio of the claimed distance. The applicant is respectfully reminded that a period means a measure of the repeated events. If the stripes are getting narrower or wider the measure of the repetition or period will change too. This means it will not be possible to have a set transverse ratio as defined by the claim. The specification fails to teach adequately how could these apparent contradictions be achieved. Clarifications are certainly required. Claims 2-4 and 7 inherit the rejection.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bhatia et al (PN. 6,269,208).**

*Claim 1 has been significantly amended and new grounds of rejection are therefore necessitated.*

Bhatia et al teaches an *apparatus and method* for photo-inducing a fiber grating in a waveguide wherein the apparatus comprises a *ultraviolet light source* (16) for generating a UV light, a lens system (24 and 36 or 122) serves as the *lens system* for projecting the UV light and an *amplitude mask* (120) for selectively transmitting the UV light onto a optical fiber waveguide (128), (please see Figures 1 and 4, columns 3-4 and 6-7). Bhatia et al teaches that the amplitude mask has a definite period as shown in Figure 4. The lens system converges the ultraviolet light rays to a converging point (136, Figure 4). Bhatia et al teaches that the apparatus is arranged to have the distance between the converging point of the lens system and the amplitude mask designated as " $Z_A$ " and the distance between the amplitude mask and the waveguide designated as " $d_A$ ", (please see Figure 4 and column 7, lines 10-25). This means the claimed *longitudinal ratio* is well defined as  $Z_A/(d_A + Z_A)$ . By simple geometrical calculation, the period for the grating formed on the waveguide can be determined and it is proportional to the period of the amplitude mask. In fact, the claimed *transverse ratio* ( $\Lambda_0/\Lambda$ ), which is the ratio between the period of amplitude mask ( $\Lambda_0$ ) and the period of the grating ( $\Lambda$ ), is equal to the longitudinal ratio  $Z_A/(d_A + Z_A)$ , as the result of geometry and trigonometry of a triangle. In fact, because the trigonometry of the triangular structure of the positions of the converging point, the amplitude mask and the optical fiber as shown in

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Figure 4 of Bhatia et al, no matter how one moves the amplitude mask or the lens system the longitudinal ratio will always equal to the transverse ratio. The grating and the stripe pattern with the periodicity are then fully determined by the geometry of the apparatus.

The reference has met all the limitations of the claims. **Claim 1 has been amended** to include the feature of comprising a step of determining a thickness of the amplitude mask so that stripes formed on the optical fiber become narrower as the stripes become more distant from the optical axis. This reference has not disclosed such explicitly. However, for any amplitude mask, which implicitly has *certain thickness*, the thickness will play an important role in determining the modulation, eventually the grating pattern, impart on the incident light to the optical fiber. It is implicitly true that the light distribution on the light exit side surface of the mask determines the grating pattern or the stripe pattern of the fiber grating and it is implicitly true that the finite thickness of the amplitude mask will bend the light rays as they pass through the mask, this will implicitly cause the grating stripes formed on the optical fiber become narrower as the stripes become distant from the optical axis.

Bhatia also does not teach that the light source and the rest of the elements are arranged on an optical axis. However to have the light source placed along the same optical axis or not does not change the operation of the apparatus for fabricating the fiber grating. Such modification is therefore considered to be obvious matters of design choice to one skilled in the art for the benefit of providing different arrangement for the apparatus.

With regard to claim 2, Bhatia et al teaches that the UV laser light source is an *excimer laser* source, (please see column 3 lines 59-65).

With regard to claims 3, Bhatia et al teaches that the lens system includes a *cylindrical lens* (24, Figure 1), but it does not teach explicitly that it also includes a concave lens. However Bhatia et al teaches specifically that the pitch spacing of the resulting grating on the waveguide is controlled by the rate of divergence of the amplitude mask and the distance between the waveguide and the mask, (please

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see column 7, lines 10-15). It would then have been obvious to one skilled in the art to add additional optical element to control the divergence of the light through the mask for the benefit of obtaining desired pitch for the grating on the waveguide. A concave lens is a well-known optical element that adds divergence to the light beam. It would therefore have been one of the obvious options and design choices to one skilled in the art to design the apparatus to obtain desired grating pitch. Furthermore, it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regard to claim 4, it is implicitly true that the converging point of the lens field may be adjusted by varying the distance between the two lenses.

With regard to claim 7, Bhatia et al does not teach explicitly about the size of the periodicity of the amplitude in comparison with the wavelength of the writing UV laser light. However it is implicitly true that the periodicity must be greater than the wavelength in order to photo-inducing the mask pattern on the waveguide without causing the UV light passing through the mask to interfere with each other.

### ***Double Patenting***

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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7. Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6-7 and 10 of U.S. Patent No. 6,201,911. Although the conflicting claims are not identical, they are not patentably distinct from each other because they essentially disclose the same apparatus and method implicitly included for manufacturing a fiber grating using ultraviolet laser light source and an amplitude mask. The position of the light source is considered to be obvious matter of design choice to one skilled in the art since the position of the light source does not change the fabrication of the fiber grating. The amendment to claim 1 concerning the width of the stripe does not distinguish the claim from the cited patent since this feature is an implicit feature of any amplitude mask having finite thickness.

*Response to Arguments*

8. Applicant's arguments with respect to claims 1-4 and 7 have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's arguments based on the newly amended features are fully addressed in the paragraphs above.

*Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action



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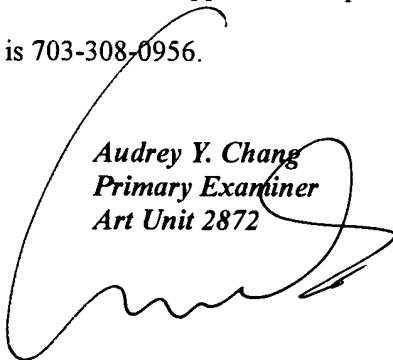
is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang  
Primary Examiner  
Art Unit 2872*



A. Chang, Ph.D.  
July 2, 2003